

(WQ – 9)Gypsum (CaSO₄·2H₂O) & Elemental Sulfur (S⁰) Soil Amendment GUIDE

NOTE: If you're not sure of the benefits of gypsum or elemental sulfur, then demonstrate on a small portion of a field & evaluate results.

Soil Texture	% Clay	CEC Range (meq/100 g)		Soil Bulk Density (g/cm ³)		Soils Intake Family	Inches Applied			Infiltration Assessment						
							1.0	2.0	3.0	SAR	Restriction on Use Units: ECiw (dS/m)					
											None	Slight to Mod.	Severe			
Sands	2 – 8	2 – 6	Cation Exchange Capacity (CEC) is based on % Clay & mineral type (e.g. Kaolinite, Montmorillonite) & % Organic Matter	1.65		0.1	Infiltration Time (Hrs)			0 – 3	> 0.7	0.7 – 0.2	< 0.2			
Loamy Sands	2 – 14			1.6												
Fine Sands	2 – 8			1.65			2.8	10.5	22.3	3 – 6	> 1.2	1.2 – 0.3	< 0.3			
Very Fine Sands				2 – 14			1.6	1.0	3.5	6.8	6 – 12	> 1.9	1.9 – 0.5	< 0.5		
Loamy Fine Sands							2 – 18	1.56	0.63	2.0	3.8	12 – 20	> 2.9	2.9 – 1.3	< 1.3	
Loamy Very F. Sands	1.53							0.75	0.48	1.5	2.8	20 - 40	> 5.0	5.0 – 2.9	< 2.9	
Sandy Loam	7 – 15	1.42		1.0		0.33		1.0	1.8							
Fine Sandy Loam		1.46					1.25			0.28	0.8	1.5	Soil Structure		Downward Movement of water	
Very F. Sandy Loam		1.47											Single Grain	Rapid		
Loam		1.4											Granular	Rapid		
Silt Loam		1.27											Blocky	Moderate		
Silt		1.32											Prismatic	Moderate		
Sandy Clay Loam	28 – 38	1.33		1.75		0.23		0.7	1.3				Platy	Slow		
Silty Clay Loam		1.23					Massive			Slow						
Clay Loam		1.25														
Clay	42 – 98	15 - 30														
$\text{constant} \times \text{soil depth} \times \text{bulk density} \times \text{CEC} \times (\text{initial SAR} - \text{final SAR}) \times \text{multiplication factor} \div \text{gypsum purity} \div 2000 = \text{gypsum requirement}$ $(23.1) \times (\text{feet}) \times (\text{g/cm}^3) \times (\text{meq/100 g}) \times (\text{initial SAR} - \text{final SAR}) \times (1.25) \div (\%) \div (2000) = (\text{tons/ac})$																
Gypsum Example	23.1 x 0.5 ft x 1.34 g/cm ³ x 14.0 meq/100 g x (13 – 6) x 1.25 ÷ 0.80 ÷ 2000 = 1.2 tons of Gypsum/ac															
Sulfur Example	1.3 tons/ac of pure gypsum needed x 0.19* = 0.25 tons of Elemental Sulfur/ac needed (or 494 lbs./ac)															

Considerations in the use of soil amendments: Soils Intake Family, Water Quality (ECiw & SAR), Soil Structure, Stratified Soils, Irrigation Water Management, crop rotations (residue management), leaching requirement, tillage operations (i.e., Soil Conditioning Index (SCI) and Soil Tillage Intensity Rating (STIR)), % Soil Organic Matter, etc. **Important:** Are Soils characterized as Saline, Saline-Sodic or Sodic.

*Use 0.19 to convert an equivalent amount of pure gypsum into an S⁰ requirement (Ref. NRCS Salinity Mgmt. for Soil & Water – pg. 5.42). rudy garcia 2008